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Maine Agricultural Experiment Station

BULLETIN No. 79. JANUARY, 1902.

POULTRY EXPERIMENTS IN 1900 AND 1901.

This Bulletin contains an account of experiments in fattening chickens for market, the incubation of eggs stored under different conditions, the relation of mating to fertility of eggs, and breeding for egg production, including the egg record of the breeding pens for 1899, 1900 and 1901.

Requests for bulletins should be addressed to the
Agricultural Experiment Station,
Orono, Maine.

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FEEDING CHICKENS FOR GROWTH.

By G. M. Gowell.

COOPS vs. HOUSE AND YARD.

This test is a continuation of work reported in Bulletin No. 64 where small coops, holding four chickens each, were compared with small pens containing 20 birds of the same age and size. The purpose was to learn if close confinement in small numbers, gives better results than where larger numbers are kept together without close crowding.

The English and French chicken fatteners, who make a specialty of the business, fattening many thousands each year, use small coops holding four or five birds each and claim advantages for the method. This plan of fattening has been adopted by the Canadian government and illustrated by it at various places, for the purpose of encouraging the use of better methods by the people. The work has been favorably noticed by the poultry journals of this country and under this encouragement the method seemed likely of adoption by our poultrymen and farmers. The coops we used are similar in size and form to theirs and our food was prepared and fed in the same way as theirs, but it was of different composition, as theirs was made largely from finely ground oats and tallow, while we used corn meals, wheat middlings and ground beef scrap, with small quantities of finely ground oats in the earlier tests. That our gains with the birds in small coops were as great as those made by the foreigners is shown by the reports which they have published.

The coops that we used had each a floor space 16 by 23 inches. They were constructed of laths with close end partition of boards. The floors were of laths placed three-fourths of an inch apart, and one inch from the walls, so that they might be kept clean by the moving about of the birds. The coops were made, two together, without cutting the laths. The laths ran lengthwise of the coops on bottom, top and back, but on the front they were placed upright, and two inches apart, so that the chickens could feed through between them readily. V-shaped troughs with three inch sides were placed in front of and about two inches above the level of the floor of the coops.

FEEDING TEST NO. 4.

On July 25th 20 Plymouth Rock cockerels that were 95 days old, and even in size and thrift were put in five of the coops and fed twice daily for 28 days on porridge made from a mixture of 100 pounds of corn meal, 100 pounds of wheat middlings, and 40 pounds of animal meal mixed up with cold water. They were fed all they would eat twice each day. On the same day that these birds were cooped, 68 of their mates, of the same age and quality, were put in a chicken house 9 by 11 feet in size, with an attached yard 15 by 20 feet. There were no green plants in this yard. These birds were fed in the same way, and on the same material as their mates in the small coops. The results are shown in the tables that follow:

CHICKENS IN SMALL COOPS.

FEED MIXED WITH WATER.

Coop.	Group 1.	Live Weights during Test.					Increase.	
		July 25.	August 1.	August 8.	August 15.	August 22.	Lot.	Each.
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1	Four Plymouth Rock cockerels.......	12.6	14.4	15.8	17.7	19.1	6.5	1.62
2	Four Plymouth Rock cockerels........	13.8	15.4	16.4	16.9	18.5	4.7	1 17
3	Four Plymouth Rock cockerels...	13.7	15.1	16.2	17.4	18.4	4.7	1.17
4	Four Plymouth Rock cockerels	14.0	16.0	17.3	17.8	18.6	4.6	1.15
5	Four Plymouth Rock cockerels........	14.8	17.1	18 5	20.0	21.2	6.4	1.60
	Total weights	68.9	78.0	84.2	89.8	95.8	26.9	1.34
	Increase each week......................	....	9.1	6.2	5.6	6.0		

Pounds of dry meal mixture used, 240.
Pounds of mixture required to produce a pound of gain, 8.92.
Age of chickens at commencement of test, 95 days.

SIXTY-EIGHT CHICKENS (MATES TO THOSE IN GROUPS 1 AND 2) CONFINED IN SMALL HOUSE AND YARD, AND FED 28 DAYS ON SAME FOOD AS THOSE IN GROUP 1.

Live Weights.		Increase in Weights.	
July 25.	August 22.	Lot of 68.	Each.
199.3 pounds	296.8 pounds....	97.5 pounds.	1.43 pounds.

Pounds of dry meal mixture used, 513.
Pounds of mixture required to produce a pound of gain, 5.26.

FEEDING TEST NO. 5.

The conditions under which this test was made were like those in No. 4 except in the composition of the food. The chickens were from the same hatch and of like quality with the others; both trials were made at the same time and the food was prepared and fed in the same manner in both cases. In this test the food was from a mixture of 100 pounds of corn meal, 100 pounds of wheat middlings and 33 pounds of meat meal, mixed as used with cold skim-milk. Two pounds of the skim-milk was used with one pound of the mixed meal.

The following tables show the work as it progressed and the results:

CHICKENS IN SMALL COOPS.

FEED MIXED WITH MILK.

Coop.	Group 2.	Live Weights during Test.					Increase.	
		July 25.	August 1.	August 8.	August 15.	August 22.	Lot.	Each.
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
6	Four Plymouth Rock cockerels....... .	13.3	14.2	16.2	18.0	19.2	5.9	1.47
7	Four Plymouth Rock cockerels.........	14.8	16.6	18.1	19.5	21.4	6.6	1.65
8	Four Plymouth Rock cockerels....	12.4	14.1	16.0	17.4	18.8	6.4	1.60
9	Four Plymouth Rock cockerels.........	15.0	17.6	19.8	22.0	23.4	8.4	2.10
10	Four Plymouth Rock cockerels..... ..	12.1	14.4	15.8	17.6	18.5	6.4	1.60
	Total weights................	67.6	76.9	85.9	94.5	101.3		
	Increase in weights	......	9.3	9.0	8.6	6.8	33.7	1.68

Pounds of dry meal mixture used, 231.
Pounds of skim-milk used, 465.
Pounds of dry mixture required to produce a pound of gain, 6.85.
Age of chickens at commencement of test, 95 days.

SIXTY-EIGHT CHICKENS (MATES TO THOSE IN GROUPS 1 AND 2) CONFINED IN SMALL HOUSE AND YARD, AND FED 28 DAYS, ON SAME FOOD AS THOSE IN GROUP 2.

Live Weights.		Increase in Weights.	
July 25.	August 22.	Lot.	Each.
202.9 pounds.... ...	319.4 pounds.....	116.5 pounds..........	1.713 pounds.

Pounds of dry meal mixture used, 469.5.
Pounds of skim milk used, 934.
Pounds of dry mixture required to produce a pound of gain, 4.03.

FEEDING TEST NO. 6.

The purposes and conditions were the same as with No. 4 excepting that the chickens were 160 days old. This test was continued 21 days. The results are given in the following tables:

CHICKENS IN SMALL COOPS.

FEED MIXED WITH WATER.

Coop.	Group.	Live Weights During Test.				Increase.	
		October 11.	October 18.	October 25.	November 1.	Lot.	Each.
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1	Four Plymouth Rock cockerels	17.4	18.1	20.4	22.4	5.0	1.25
2	Four Plymouth Rock cockerels	19.7	20.6	20.8	21.4	1.7	.42
3	Four Plymouth Rock cockerels	19.7	20.6	23.2	23.3	3.6	.90
4	Four Plymouth Rock cockerels	20.0	21.3	21.8	22.8	2.8	.70
5	Four Plymouth Rock cockerels	18.8	19.8	20.6	21.3	2.5	.62
	Total weights	95.6	100.4	106.8	111.2	15.6	.78
	Increase each week................... ..	....	4.8	6.4	4.4		

Pounds of dry meal mixture used, 152.
Pounds of dry mixture required to produce a pound of gain, 9.74.
Length of feeding period, 21 days.
Age of chickens at commencement of test, 160 days.

TWENTY-FIVE CHICKENS (MATES TO THOSE IN TABLE NEXT PRECEDING THIS) CONFINED IN SMALL HOUSES AND FED 21 DAYS ON SAME FOOD MIXTURE AS THOSE IN TABLE REFERRED TO.

Live Weight.		Increase in Weights.	
October 11.	November 1.	Lot.	Each.
121.1 pounds.	132.3 pounds.	11.2 pounds	.45 pounds.

Pounds dry meal mixture used, 189.
Pounds of dry mixture required to produce a pound of gain, 16.87.

FEEDING TEST NO. 7.

The conditions were the same as with No. 6 except that the porridge was made by use of skim-milk instead of water. The results are given in the tables which follow:

CHICKENS IN SMALL COOPS.

FEED MIXED WITH MILK.

Coop.	Group.	Live Weights During Test.				Increase.	
		October 11.	October 18.	October 25.	November 1.	Lot.	Each.
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs	Lbs.
6	Four Plymouth Rock cockerels	18.5	20.5	21.0	22.0	3.5	.87
7	Four Plymouth Rock cockerels	20.2	21.4	22.6	24.4	4.2	1.05
8	Four Plymouth Rock cockerels	20.8	22.4	22.8	23.5	2.7	.67
9	Four Plymouth Rock cockerels.	18.7	20.4	21.0	22.4	3.7	.92
10	Four Plymouth Rock cockerels.	22.0	23.3	25.2	25.4	3.4	.85
	Total weights	100.2	108.0	112.6	117.7	17.5	.875
	Increase each week	....	7.8	4.6	5.1		

Pounds of dry meal mixture used, 144.
Pounds of skim milk used, 290.
Pounds of dry mixture required to produce a pound of gain, 8.22.
Length of feeding period, 21 days.
Age of chickens at commencement of test, 160 days.

TWENTY-FIVE CHICKENS (MATES TO THOSE IN THE TABLE ABOVE) CONFINED IN SMALL HOUSE AND FED 21 DAYS ON THE SAME FOOD MIXTURE AND MILK AS THOSE IN THE TABLE REFERRED TO.

Live Weights.		Increase in Weights.	
October 11.	November 1.	Lot.	Each.
121.7 pounds	144.9 pounds........	23.2 pounds..........	.932 pounds.

Pounds dry meal mixture used, 177.
Pounds skim milk used, 360.
Pounds mixture required to produce a pound of gain, 7.63.

CONCLUSIONS.

Small coops vs. houses and yards—Including the test reported in Bulletin No. 64, this Station has made six group trials of close confinement against partial liberty, in fattening chickens. These have comprised the use of 35 separate coops and 6 houses. Three hundred and twenty-one chickens of different ages have been fed in these 41 lots, in periods of 21, 28, or 35 days each, and the occupants of all coops have had weekly weighings.

In 11 of the coops containing 4 birds each, the gains have been greater than in the houses and yards containing from 20 to 68 birds, with which they were matched. In the 24 other coops, the gains were less than in the houses and yards with which they were similarly matched. In five of the six groups, the gains have been greater in the houses and yards, and in one of the six groups the gain has been greater in the coops.

These results show that close cooping is not necessary in order to secure the greatest gains in chicken fattening, and that the chicken made greater gains when given a little liberty than when kept in close confinement.

The labor involved in caring for birds in small numbers in coops, is greater than in caring for an equal number in a house and yard. The results are so pronounced that we regard them as conclusive.

Relation of age to fattening—The tables show plainly that with poultry the periods of cheap and rapid gains in weight come early in life. The greatest gains were made in one of the tests reported in Bulletin No. 64, where in a feeding period of 35 days, 40 chickens confined in coops gained an average of 2.23 pounds each, and 20 others of like age and condition fed in comparison in a house and yard gained 2.47 pounds each. The rations which these birds received was partly made up of ground oats, and the feeding period was 35 days in length, instead of 21 or 28 days, as in tests Nos. 4, 5, 6 and 7. These conditions probably account for the greater gains which were made.

In tests Nos. 4 and 5 the birds were 95 days old at the beginning of the feeding period, which continued 28 days. The average gain was 1.54 pounds each.

In tests Nos. 6 and 7 the birds were 160 days old at the beginning of the test, which lasted 21 days instead of 28 as in Nos. 4 and 5. They gained .75 pounds each or about one-half as much as the gain made by the chickens that were 95 days old. The matter of age was not designed as a feature of the tests when planning them, but the results are so marked that they should not be overlooked.

Skim-milk as chicken food.—In tests 4 and 6 water was used in mixing the meal for feeding, and in 5 and 7 milk was used.

The composition of the mixture in which water was used was 100 pounds of corn meal, 100 pounds of wheat middlings and 40 pounds of ground beef scrap. The mixture in which milk was used was the same as the water mixture, except that it contained 33 pounds of ground beef scrap instead of 40 as in the water mixture. This difference was made so that the two rations should be equal in digestible protein. Two pounds of milk were used to each pound of the meal mixture.

The following table shows the results collectively. Compare tests No. 4 with No. 5, and No. 6 with No. 7 for results in separate coops.

Chickens 95 days old.	Feed mixed with water.	Feed mixed with milk.
	Lbs.	Lbs.
In coops, gained in 28 days each	1.34	1.68
In houses, gained in 28 days each	1.43	1.71
Chickens 160 days old.		
In coops, gained in 28 days each	.78	.87
In house, gained in 28 days each	.45	.93

The use of meat meal in chicken fattening—Late in the season 40 chickens that were 161 days old, and averaged in weight a little over five pounds each, were divided into 10 lots. Each lot of four birds was put into a small fattening coop and fed for 28 days. Those in coops 1 to 5, constituting group 1, were fed from a mixture of 100 pounds of corn meal, 100 pounds of wheat middlings and 50 pounds of meat meal. Twice daily as needed for use, porridge was made from this meal mixture with cold water. Those in coops 6 to 10, constituting group 2, were fed on porridge made from equal quantities of corn meal and wheat middlings, without meat meal. This porridge was also made with cold water.

The average increase in weight of each of the 20 birds fed without meat meal was .72 pounds, and the average increase of those fed with meat meal was .92 pounds. Where no meat meal was fed, 14.96 pounds of dry meal was required to make a pound of gain. Where meat meal was fed, 12.07 pounds of dry meal produced a similar gain.

This indicates that where one fifth of the food used was meat meal, a pound of gain in the live birds was made by the use of about one fifth less weight of food than where no meat meal was used. The mixture containing the meat meal cost 1.15 cents per pound, while the mixture without meat meal cost 1 cent per pound. Where meat meal was fed, a pound of live weight of chicken was made at a cost of 13.88 cents. Where no meat meal was used a pound of gain cost 14.96 cents.

These tests were made with birds that were advanced in age and growth, and the gains were slow and expensive. In other feeding tests that we have made with chickens that were from 100 to 130 days old, the gains have been much greater and the costs per pound as small as 5 to 8 cents per pound, when the meal used was reckoned at the same price per pound as in this test. The data of the test is shown in the tables following:

CHICKENS FED WITH MEAT MEAL IN RATION.

Coop.	GROUP 1.	LIVE WEIGHTS DURING TEST.					INCREASE.	
		October 5.	October 12.	October 19.	October 26.	November 2.	Lot.	Each.
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1	Four White Wyandottes	20.2	22.3	23.3	23.6	24.6	4.4	1.10
2	Four White Wyandottes	20.1	21.9	22.1	22.4	23.4	3.3	.82
3	Four Plymouth Rocks	20.4	22.8	23.2	23.6	24.8	4.4	1.10
4	Four Plymouth Rocks	20.7	22.4	23.4	23.8	24.2	3.5	.87
5	Four White Wyandottes	21.5	22.1	23.1	23.3	24.2	2.7	.67
	Total weights............	102.9	111.5	115.1	116.7	121.2		
	Increase in weights	......	8.6	3.6	1.6	4.5	18.3	.915

Pounds of dry grain mixture used in the test, 221.
Pounds of mixture required to produce a pound of gain, 12.07.
Age of birds at beginning of test, 161 days.
Average weight of birds at beginning of test, 5.14 pounds.

CHICKENS FED WITHOUT MEAT FOOD IN RATION.

Coop.	GROUP 2.	LIVE WEIGHTS DURING TEST.					INCREASE.	
		October 5.	October 12.	October 19.	October 26.	November 2.	Lot.	Each.
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
6	Four White Wyandottes	21.4	22.0	22.4	22.5	22.8	1.4	.35
7	Four Plymouth Rocks	21.4	22.1	22.4	22 4	24.2	2.8	.70
8	Four Plymouth Rocks	20.6	22.9	23.6	24.4	25.6	5.0	1.25
9	Four White Wyandottes	20.7	22.2	22.6	22.8	23.0	2.3	.57
10	Four White Wyandottes	20.3	21.6	21.8	22.8	23.1	2.8	.70
	Total weights	104.4	110.8	112.8	113.9	118.7		
	Increase in weights............	......	6.4	2.0	1.1	4.8	14.3	.715

Pounds of dry grain mixture used in the test, 214.
Pounds of mixture required to produce a pound of gain, 14.96.
Age of birds at beginning of test, 161 days.
Average weight of birds at beginning of test, 5.22 pounds.

EXPERIMENTS IN INCUBATION.

G. M. Gowell.

TREATMENT OF EGGS BEFORE INCUBATION.

Close Cases vs. Light and Air.

Some of the influences which may affect the strength of the germs of eggs that are kept for some time before being incubated, were studied by keeping part of them shut up in the dark, in ordinary egg cases for ten days, while another lot from the same hens was kept spread out in open pans, in the light, on a stand beside the darkened case. This gave both lots practically the same temperature of 62° F. They were turned daily. It was unfortunate that the eggs were running low in fertility when all of the tests which are reported in this Bulletin were being made, but the hens had been laying very heavily for a long time, and that probably accounts for their low fertility. Two pens of hens were selected and the eggs of each individual were divided evenly into two lots by alternating them in the order in which they were laid. This was readily done as trap nests are used with all our birds and all the hens are banded and numbered. By taking each hen's eggs as laid and dividing them by placing alternate eggs in the same lots, a fair division was secured by which it was hoped to avoid the difficulties which might arise from the physical changes which are liable to take place in laying hens.

The eggs were laid between May 25th and June 2d. After 160 were obtained, they were kept for the next ten days, until June 12th and then put together into the same incubator, each egg being marked with the number of the hen that laid it, the date and its class.

The following tables show some of the details of the work and the results of the test.

DATES ON WHICH EGGS WERE LAID AND RESULTS OF INCUBATION.

Number of hens.	May 25.	May 26.	May 27.	May 28.	May 29.	May 30.	May 31.	June 1.	June 2.
641...	L. Inf..	....	D. Inf..	L. Inf..	....	....	....	L. Inf	D. Inf
642...	D. 12..	L. 12....	D. 12....	L. C'k..	D. 12....	L. 12..	D. 12..	L. C'k	D. 12
643...	....	D. C'k..	L. 12....	D. 12....	L. C'k..	D. C'k.	L. C'k	D. C'k	....
644...	L. 12....	....	....	D. 12....	....	....	....	....	......
645...	L. 12....	....	....	D. 12....	L. 12....	D. C'k.	....	L. 12..	......
646...	D. C'k..	....	....	L. 20....	D. 20....	L. 12..	D. C'k.	L. 15..	D. 12.
647...	L. 12....	D. 12....	L. C'k..	D. 12....	L. 12....	....	....	D. 12..	L. 12.
648...	....	....	....	....	....	....	D. C'k.	....	L. C'k
649...	D. C'k.	L. 12....	D. C'k..	L. 12....	D. 12....	....	L. 12..	D. 12..	L. C'k
650...	....	D. Inf..	L. 12....	D. 12....	....	L. 20..	....	D. 12..	L. 20.
652...	L. 12....	....	....	D. C'k..	....	....	....	....	....
653...	....	....	....	....	....	D. 12.	L. 20..	D. 12..	....
654...	....	....	D. C'k..	....	L. C'k..	D. 12..	L. C'k.	D. C'k	L. 12.
657...	D. C'k..	....	....	L. 12....	D. C'k..	L. 20..	D. 12..	L. 12..	....
658...	....	....	....	D. C'k..	L. C'k..	....	D. C'k.	L. 12..	D. C'k
659...	L. 12....	D. 12....	L. 12....	D. C'k..	L. 12....	....	D. 12..	L. C'k	....
661...	D. Inf..	L. 12....	D. 12....	L. 20....	D. 12....	....	L. 12..	D. 12..	....
662...	L. 12....	....	D. 12....	L. 12....	D. C'k..	....	....	....	L. 12
664...	D. 12...	....	L. C'k..	D. C'k..	L. 15....	....	D. 12..	L. 20..	D. C'k
665...	....	....	D. 12....	L. 12....	D. 12....	L. 12..	....	D. C'k	L. C'k
668...	....	....	....	....	L. C'k..	D. 14..	L. 14..	D. 20..	....
669...	L. C'k..	D. 12....	L. 12....	D. C'k..	L. 12....	D. C'k.	L. 12..	D. C'k	L. 20
670...	....	....	D. C'k..	L. C'k..	....	D. C'k.	....	L. C'k	D. C'k
671...	....	....	....	....	....	....	D. 20..	....	L. 12
672...	L. 12....	D. 12....	L. 12....	....	D. 12....	L. 12..	D. C'k.	L. C'k	D. 20
674...	....	....	....	....	D. C'k..	L. C'k.	D. 12..	L. 20..	D. 20
676...	D. Inf..	L. Inf..	D. Inf..	....	L. Inf..	....	D. Inf	....	....
678...	L. 12....	....	D. 12....	....	....	....	....	....	....
680...	D. Inf..	L. Inf..	D. Inf..	L. Inf..	D. Inf..	L. Inf.	....	D. Inf	L. Inf

D means that the eggs in the spaces in which it occurs were kept in the dark and the letter L means those that were in the light.

C'k means that a chick was hatched from the egg.

Inf. means that the eggs were completely infertile.

The 12 signifies that the germs stopped developing by or before the 12th day after incubation commenced, and the figures 20 indicate that development ceased between the 12th and 20th days.

SUMMARY OF RESULTS

Method of storing eggs.	Number of eggs incubated.	Number of chicks hatched.	Number of eggs infertile.	Number of eggs in which development stopped by the 12th day of incubation.	Number of eggs in which development stopped between 12th and 20th days of incubation.
In closed cases............	82	30	11	36	5
In open air............	77	19	9	40	9

Effects of Temperature upon Eggs while being held for Incubation.

From May 25th to June 2d all of the eggs laid by 24 hens were saved and held 10 days, until June 12th before being incubated. The eggs from each hen were divided into two lots by selecting each alternate one as laid. One of the lots was placed in a room with a temperature of 70° F. and the other lot was put in another room where the temperature was 50° F. There was about the same amount of moisture in each room, and both were equally light. The eggs were in open boxes and were turned each day. The temperatures were steadily maintained through the 10 days, at the end of which time the eggs were all put together into the same incubator where they were subject to like conditions.

The tables below show the behavior of the eggs from each individual hen, under the same, and varied temperature, as well as the results of the test.

DATES ON WHICH EGGS WERE LAID AND RESULTS OF INCUBATION.

Number of hens.	May 25.	May 26.	May 27.	May 28.	May 29.	May 30.	May 31.	June 1.	June 2.
601	70°. Inf.	50°. Inf.	70°. Inf.	50°. Inf.			70°. 12.	50°. 20.	70°. 12.
604	50°. 12.		70°. C'k.	50°. C'k.		70°. 20.		50°. 20.	
606	70°. 12.		50°. C'k.		70°. C'k.		50°. 12.		
607	50°. 20.	70°. 20.	50°. C'k.	70°. C'k.	50°. 12.				
608	70°. 12.			50°. 20.	70°. 12.	50°. 12.	70°. 20	50°. C'k	70°. 12.
609						70°. C'k		50°. C'k	70°. C'k
612	70°. 12.	50°. 20.	70°. C'k.		50°. C'k.	70°. C'k	50°. C'k	70°. 12.	50°. C'k
616	50°. 20.		70°. C'k.		50°. 12.			70°. 20.	50°. 20,
617		70°. C'k.	50°. C'k.	70°. 12.	50°. 20.		70°. 20.	50°. C'k	70°. 20.
619		50°. 12.	70°. 20.	50°. 12.	70°. 12.	50°. 20.	70°. 20.	50°. C'k	70°. 20.
620		70°. C'k.			50°. 20.		70° C'k	50°. C'k	70°. 20.
621		50°. C'k.	70°. 20.	50°. 20.		70°. 20.	50°. C'k	70°. C'k	
622					70°. C'k.	50°. C'k	70°. C'k	50°. 20.	70°. 12.
623				50°. Inf.		70°. Inf.	50°. Inf.		70°. Inf.
624	50°. 20.	70°. 20.	50°. 12.	70°. 12.	50°. 12.		70°. C'k		
625		50°. 20.	70°. 20.	50°. 20.	70°. C'k.			50°. 20.	70°. 20.
626	70°. C'k.	50°. 20.		70°. C'k.	50°. C'k.				
628		70°. 12.		50°. 12.	70°. 12.		50°. 20.		70°. 20.
630								70°. C'k	50°. 12.
631	50°. 12.			70°. 20.	50°. 20.		70°. 12.	50°. 12.	70°. 12.
632	70°. 12.		50°. 12.	70°. C'k.		50°. 12.			
635	50°. 20.	70°. 20.	50°. 20.	70°. 20.		50°. 20.		70°. 12.	50°. C'k
636		50°. 12.		70°. 12.					
640	70°. C'k.	50°. C'k.		70°. C'k.	50°. C'k.	70°. C'k	50°. 12.		70°. 12.

The figures 50° mark the eggs that were kept at fifty degrees of temperature and the figures 70° indicate the eggs that were held at seventy degrees.

The other instructions are explained at foot of table on page 19.

SUMMARY OF RESULTS.

Temperature at which eggs were kept.	Number of eggs incubated.	Number of chicks hatched.	Number of eggs infertile.	Number of eggs in which development stopped by 12th day of incubation.	Number of eggs in which development stopped between 12th and 20th day of incubation.
70° F	66	23	4	20	19
50° F	62	18	4	18	22

Resting Eggs after transit before Incubating them.

Poultry breeders and shippers of eggs for incubating purposes frequently instruct purchasers to rest their eggs for 24 hours after their receipt before putting them into incubators, claiming better results from eggs so treated than where incubating commenced immediately upon their arrival.

To watch the results of such treatment, all of the eggs laid by 26 White Wyandotte hens, from May 25th to June 2d, were divided into two lots by alternating them as laid by each hen. Part of the eggs laid each day were put in one lot and part in the other. This and the alternating of the eggs was done so as to secure as nearly as possible equal conditions in each lot. Both of these lots of eggs were put in an ordinary shipping egg case and sent from Orono by express, over the Maine Central and the Bangor and Aroostook Railroads to Houlton and return, and after remaining in the express office at Orono over night, the journey to Houlton and return was repeated. The eggs were on the road and waiting at the railroad stations about 36 hours, and the distance covered was 514 miles. Upon their last arrival at Orono, after transit they were immediately taken to the incubator room, and one lot put into an incubator with a temperature of 103°, while the other lot was allowed to rest 24 hours, at the end of which time they were put into the incubator together with the first lot. The day before hatching was due to commence, one lot of the eggs was removed to another machine which had the same temperature and moisture as the first one. This was done so as to avoid the difficulties which might arise from the hatching of eggs in the same machine with other eggs that were not due. The details and results are shown in the following tables:

DATES ON WHICH EGGS WERE LAID.

Number of hens.	May 25.	May 26.	May 27.	May 28.	May 29.	May 30.	May 31.	June 1.	June 2.
741...	R. 12	N. C'k	...	R. 12	N. Inf	R. C'k	N. C'k	...	...
742...	...	R. Inf	N. Inf	R. Inf	N. Inf	...	R. 12	N. C'k	R. 20
743...	...	N. Inf	R. 20	...	N. C'k	...	R. 20	...	...
744...	N. Inf	R. Inf	N. C'k	R. C'k	N. C'k	...	...	...	...
745...	R. 12	N. C'k	...	R. 20	...	N. 12	R. 20	N. 20	...
747...	R. Inf	N. Inf	...	R. 12	...	...	N. C'k	...	...
748...	N. C'k	R. C'k	N. 12	R. C'k	...	...	...	...	...
749...	R. 12	N. Inf	R. Inf	N. Inf	R. Inf	N. Inf	R. Inf	N. Inf	...
753...	N. Inf	R. C'k	N. 20	R. C'k	...	...	R. 12	N. C'k	R. C'k
754...	...	...	...	R. 12	...	N. 12	...	...	R. C'k
756...	...	R. Inf	...	N. 12	R. Inf	...	N. 12	...	...
760...	...	...	R. 12	N. C'k	...	R. 20	...	N. 12	...
762...	N. C'k	...	R. 20	N. C'k	R. 20	...	N. 20	R. 12	N. C'k
763...	...	N. 12	R. 12	...	N. C'k	R. C'k	...	N. 12	R. 12
764...	...	...	...	R. 20	N. C'k	...	R. 12	N. Inf	R. 12
765...	R. 12	N. C'k	...	R. Inf	N. Inf	R. Inf	...	N. 12	R. 12
766...	...	R. Inf	N. Inf	...	...	...	...	...	...
768...	...	...	...	...	N. 12	...	R. C'k	...	N. 12
770...	N. 20	...	R. 20	N. 20	...	...	...	...	...
772...	R. Inf	N. Inf	R. C'k	N. 12	...	...	...	...	...
774...	N. C'k	...	R. C'k	...	...	...	...	...	...
776...	R. Inf	...	...	N. C'k	...	R. 12	N. 12	...	R. Inf
777...	N. 12	...	R. C'k	...	N. C'k	R. C'k	...	N. 12	R. C'k
778...	R. 12	...	N. C'k	R. 20	N. Inf	...	R. Inf	N. 12	R. 20
779...	...	...	...	N. Inf	R. 12	...	N. 12	...	R. Inf
780...	N. Inf	...	...	R. 20	...	N. 20	R. 12	N. C'k	...

The letter R marks the eggs that rested and N indicates those that were not rested. The other marks in the table are explained on page 19.

SUMMARY OF RESULTS.

Treatment of eggs.	Number of eggs incubated.	Number of chicks hatched.	Number of eggs infertile.	Number of eggs in which development stopped by 12th day of incubation.	Number of eggs in which development stopped between the 12th and 20th days of incubation.
Rested	65	15	17	20	13
Not rested	63	22	18	17	6

TIME REQUIRED TO ESTABLISH FERTILITY IN EGGS.

The following experiment was undertaken to determine how soon after mating eggs become sufficiently fertile to yield chicks. For this purpose there were selected 20 Barred Plymouth Rock hens one year old, that had been laying heavily during the five to seven months preceding, but had not been in the company of male birds since they were young chicks. Late on the evening of May 25 a cockerel 12 months old was placed in the pen with them and kept there until the close of the test. The eggs laid each succeeding day until June 6th were incubated.

The eleven eggs laid May 26th were all removed after having been in the incubator eight days. Eight of them were clear and the three others showed very light traces of fertility. At the same time the eight eggs laid May 27th were examined and three of them showed clear, three were slightly cloudy and two had good strong centers and radiating lines. From these eggs two good strong chicks were hatched on the twentieth day of incubation. The best results were obtained from the eggs laid June 2d, eight days after the introduction of the male bird. From the ten eggs laid that day, eight good chicks were hatched and two eggs were completely infertile.

This test shows that eggs become fertile very soon after mating commences. As it was after dark when the cockerel was put in the pen with the hens it is not at all probable that he mated with any hen until daylight the next morning, May 26th, yet the eggs laid by two of the hens May 27th, not more than 40 hours after mating, yielded vigorous chicks.

TABLE SHOWING THE NUMBER OF EGGS SECURED FROM THE HENS EACH DAY AFTER THE INTRODUCTION OF THE COCKEREL, THE NIGHT OF MAY 25, AND THE NUMBER OF CHICKS HATCHED FROM THEM.

	Eggs laid.	Chicks hatched.
May 26	11	0
May 27	8	2
May 28	13	3
May 29	10	1
May 30	12	3
May 31	10	3
June 1	13	5
June 2	10	8
June 3	9	4
June 4	11	4
June 5	11	6
June 6	10	3

CONTINUANCE OF FERTILITY OF HENS' EGGS AFTER MATING CEASES.

To learn how long after the mating of hens and cockerels has been discontinued, the eggs remain sufficiently fertile to yield healthy chickens, 20 Barred Plymouth Rock hens were selected and the cockerel that had been mated with them since February 1st was removed on the evening of May 24th and was not returned again. The eggs laid on May 25th and on each succeeding day, to and including June 6th, were incubated and their fertility noted. Each day's eggs were kept in separate lots in the incubator so that at the completion of the period all eggs could be accounted for.

On the last day the eggs were saved—June 6th—the male bird had been removed from the pen containing the hens 13 days and the hens had had no opportunity to mate with other males, yet the eight eggs laid that day yielded three good chicks. The 27 eggs laid during the first three days after the removal of the male yielded ten chicks. The 30 eggs laid on the 11th, 12th and 13th days after the removal of the males yielded seven chicks.

TABLE SHOWING THE NUMBER OF EGGS SECURED FROM THE HENS EACH DAY AFTER THE REMOVAL OF THE COCKEREL THE NIGHT OF MAY 24 AND THE NUMBER OF CHICKS HATCHED FROM THEM.

	Eggs laid.	Chicks hatched.
May 25	11	4
May 26	5	2
May 27	11	4
May 28	10	4
May 29	9	3
May 30	12	4
May 31	10	4
June 1	11	3
June 2	6	2
June 3	10	2
June 4	12	4
June 5	10	0
June 6	8	3

While the results show somewhat diminished fertility, it is evident that longer test periods are needed in which to determine the limits of its duration after mating ceases. This work is to be continued with other pens of hens. The preceding table shows the results from each day's eggs.

FERTILITY OF EGGS OF DIFFERENT SHAPES.

To ascertain whether the shapes of eggs have any influence on their chick yielding capacities when incubated, 25 very long eggs, 25 short, ball shaped ones and 25 normal shaped ones were selected and incubated in the same machine with the following results:

	Chicks hatched out.	Died in shell when well grown.	Germ died by the tenth day.	Infertile.
Twenty-five normal eggs	8	3	5	9
Twenty-five very long eggs	9	2	2	12
Twenty-five short, roundish eggs	7	7	3	8

When undertaking this test it was the intention to carry each lot of chicks until their sex could be determined in order to learn whether the shape of the egg bears any relationship to the sex of the chick it may yield. With that aim all of the chicks were banded and recorded. A barn cat had other plans regarding them however, in the carrying out of which one night, the question of sex was not considered. Other tests bearing upon this subject will be made.

BREEDING FOR EGG PRODUCTION.

G. M. Gowell.

For several years past the Station has been breeding Barred Plymouth Rock and White Wyandotte hens with the hope of increasing the number and improving the size and color of the eggs.

In 1898 trap nests were devised and placed in all of the breeding pens, as described in the 14th annual report of the Station. This was done so that the producing capacities of hens could be known, and selections for breeding could be made upon merit alone.

It is known that the laws of inheritance and transmission are as true with birds as with cattle, sheep and horses and when we consider the wonderful advance in egg production that the hen has made since her domestication, there is ample reason for assuming that a higher average production than the present can be secured by breeding only to those birds that are themselves large producers. It has been found in our practice with the trap nest, that with the most careful selection we could make when estimating the capacities for egg yielding, by the types and forms of birds, we were still including in our breeding pens hens that were small workers.

A study of the monthly record sheets which follow, not only show great differences in the capacities of hens but marked variations in the regularity of their work; some commencing early in November, and continuing laying heavily and regularly month after month, while others varied much, laying well one month and poorly or not at all the next. It is impossible to account for these vagaries as the birds in each breed were bred alike, and selected for their uniformity. All pens were of the same size and shape and contained the same number of birds. Their feeding and treatment were alike throughout. Many of the light layers gave evidence of much vitality, and in many instances there were no marked indications, in form or type, by which we were able to account for the small amount of work performed by them.

EGG RECORDS FOR TWO YEARS OF HENS HATCHED DURING APRIL AND MAY 1898.

Barred Plymouth Rocks.

Number of hens.	Year.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	Yields Nov. 1st, 1898, to Nov. 1st, 1899, and Nov. 1st, 1899, to Nov. 1st, 1900.	Yields in first full year of laying.
6..	1st...	18	12	7	15	18	16	15	8	14	6	12	20	161	161
	2d	10	16	10	6	5	3	....	1	1	4	5	......	61	....
10..	1st... .	16	14	5	20	23	19	19	18	17	10	14	......	175	175
	2d	....	..	5	3	*	....	....	...	...	.....	.....	......	8	....
26..	1st.....	5	19	4	15	18	13	13	15	12	12	12	17	155	158
	2d	8	15	....	...	15	14	10	9	10	10	11	16	118	....
30..	1st.....	7	7	18	16	19	19	19	20	22	8	8	2	165	165
	2d	1	....	5	3	5	16	18	20	16	17	8	3	112	....
31..	1st.....	6	5	9	22	23	20	20	18	19	16	9	8	175	175
	2d	....	....	...	4	9	17	21	8	10	11	14	....	94	....
36..	1st....	....	15	9	23	23	19	16	21	19	13	15	8	181	201
	2d	20	5	9	16	15	13	14	13	14	15	14	11	159	... ...
45..	1st.....	...	17	22	19	22	17	15	14	13	11	7	9	142	166
	2d	13	1	....	9	6	....	...	9	17	11	11	12	89	....
51..	1st.....	....	7	14	14	20	17	16	24	24	22	18	15	191	191
	2d	...	...	...	4	9	17	21	8	10	11	14	.....	94	....
74..	1st.....	..	5	18	18	21	14	18	16	15	15	7	18	165	182
	2d	17	15	16	8	13	14	15	11	11	14	17	......	151	....
76..	1st.....	....	....	15	20	18	18	22	19	24	19	14	......	169	169
	2d	...	...	4	7	3	18	6	1	1	......	.....	......	40	....
80..	1st.....	...	...	16	22	15	7	17	17	15	19	10	12	140	160
	2d	15	5	3	16	12	6	13	8	8	9	5	3	103	....
93..	1st....	19	11	19	8	10	18	18	16	14	11	11	5	160	160
	2d	11	5	19	10	13	18	15	13	12	8	12	9	145	....
101..	1st.....	...	.	18	15	21	22	24	21	17	26	17	21	201	204
	2d	3	...	18	6	3	....	...	....	...	......	......	....	30	....
	3d	....	3	12	3	6	10	5	6	....	11	7	.....	63	... .
114..	1st....	..	....	15	22	20	14	12	14	12	9	9	9	136	149
	2d	13	....	....	....	13	18	18	12	13	14	16	13	130	....
120..	1st. ...	.. .	....	17	20	17	13	15	18	24	20	22	18	184	188
	2d	4	....	7	6	....	19	19	13	18	13	.....	......	99	....
126..	1st....	...	....	11	12	21	19	18	20	14	11	15	11	152	180
	2d	14	14	14	15	7	16	18	14	17	15	9	9	162	....
137..	1st. ...	....	..	7	19	18	18	24	21	22	19	7	. ..	155	155
	2d	...	....	4	7	7	12	18	15	19	19	6	9	116	....
151..	1st... .	....	....	9	20	16	8	13	19	18	12	15	5	135	155
	2d	13	5	11	16	15	12	18	14	10	19	19	9	161	....
159..	1st.....	....	...	4	25	9	13	13	14	14	12	15	18	137	175
	2d	20	18	14	10	11	15	17	13	13	13	12	12	168	....
205..	1st.....	....	...	....	21	23	12	21	22	19	19	15	13	165	191
	2d	14	1	11	14	15	18	20	15	15	14	14	14	165	....
208..	1st.....	....	..	2	22	19	11	19	22	15	15	12	14	151	169
	2d	3	....	20	7	12	12	16	9	3	......	......	......	82	....
209..	1st. ...	...	....	2	20	20	18	18	13	17	17	12	17	154	180
	2d	10	10	18	15	12	16	13	.. .	....	......	.....	......	94	....
228..	1st.....	....	....	....	12	14	13	17	13	15	12	13	11	120	153
	2d	16	8	9	13	15	13	15	9	10	7	......	.....	115	... .
246..	1st.....	....	....	....	14	21	17	12	21	17	22	18	1	143	143
	2d	...	...	..	....	5	11	3	6	14	6	1	......	46	....
281..	1st.....	...	....	....	12	20	15	12	16	13	17	12	12	129	167
	2d	11	18	9	8	7	9	11	8	12	12	10	10	125	....
286..	1st.. ..	...	....	....	14	23	15	18	24	25	23	26	23	191	206
	2d	1	. .	14	4	2	20	23	24	26	18	16	9	147	.. ....
	3d	...	9	2	5	6	24	23	22	20	21	*6	.....	138	....
289..	1st. ...	....	....	....	8	22	20	17	19	12	20	12	21	151	181
	2d	14	7	5	16	12	22	16	10	13	13	11	11	150	....
300..	1st. ...	...	..	....	19	18	11	17	14	13	17	8	21	138	175
	2d	20	17	10	...	3	18	15	13	14	14	12	12	148	....

EGG RECORDS FOR TWO YEARS—Continued.

Light Brahma.

Number of hens.	Year.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	Yields Nov. 1st, 1898, to Nov. 1st, 1899, and Nov. 1st, 1899, to Nov. 1st, 1900.	Yields in first full year of laying.
52..	1st. ...	....	11	19	20	21	20	19	20	21	18	19	1	189	194
	2d	5	....	10	4	4	7	6	14	11	4	11	2	78	....
55..	1st.....	...	....	....	1	11	9	3	10	7	8	1	.....	55	81
	2d	2	15	4	5	....	...	...	..	....	....	......	.....	26	....
75..	1st.....	....	....	6	14	18	15	15	15	10	9	12	......	114	130
	2d	...	12	7	....	....	....	....	....	...	.....		12	81	.. ..
116..	1st. ...	....	....	12	18	24	16	12	16	17	15	7	18	155	155
	2d	....	....	...	4	1	*	....	...	...	.....	....	......	5	.. ...
135..	1st.....	....	....	12	20	21	8	13	25	12	9	14	......	134	155
	2d	8	13	....	16	13	22	12	10	17	17	......	.....	128	... .
139..	1st.....	..	...	11	20	19	14	21	19	21	21	22	20	188	194
	2d	....	6	5	*	...	....	...	...	....	.. ...	.....	......	....	... .
146..	1st....	....	...	11	17	19	12	10	15	13	11	10	13	131	151
	2d	10	3	17	15	12	14	16	7	10	11	14	.....	129	....
147..	1st. ...	....	....	12	17	20	18	18	16	14	14	13	9	151	151
	2d	....	....	.. .	....	9	17	12	11	11	15	1	......	76	....
155..	1st. ...	....	....	....	3	18	24	20	24	14	6	19	21	149	151
	2d	2	....	....	7	3	16	21	18	18	19	19	1	124	.. ....
276..	1st.....	....	...	....	15	15	11	18	13	14	19	8	.....	113	124
	2d	....	....	11		....	....	....	...	...	.....	...	......	11	.... .
279..	1st.....	...	....	....	14	20	21	20	19	10	....	... ..	......	104	105
	2d	.. .	...	1	....	....	....	....	...	....	.....	......	......	1	... .
282..	1st.....	...	....	....	14	23	21	20	20	13	17	17	. . .	135	138
	2d	....	....	3	...	...	....	....	....	....	.....	.....	......	3	. .....
285..	1st.....	....	....	.. .	19	19	20	14	19	17	12	12	20	152	161
	2d	8	....	1	3	1	15	15	9	10	7	....	14	83	....
288..	1st.....	....	....	...	15	20	14	13	22	11	17	15	7	134	156
	2d	7	12	1	9	11	18	20	13	12	18	17	2	138	....
292..	1st.....	....	....	....	21	22	12	17	16	15	16	16	13	148	181
	2d	13	20	8	2	8	19	15	8	9	8	20	3	133	....
297..	1st....	....	....	....	14	19	19	18	23	16	10	14	16	149	149
	2d	....	....	....	6	6	15	15	12	9	3	14	.....	80	....

White Wyandotte.

Number of hens.	Year.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	Yields Nov. 1st, 1898, to Nov. 1st, 1899, and Nov. 1st, 1899, to Nov. 1st, 1900.	Yields in first full year of laying.
3..	1st. ...	20	9	1	....	17	12	13	15	14	13	9	19	142	142
	2d	....	....	....	....	17	17	9	11	11	11	.....	......	76	.... ..
4..	1st. ...	20	....	19	16	22	13	19	22	15	21	19	15	201	201
	2d	7	....	....	7	15	21	21	10	10	17	16	16	140	....
	3d	14	2	...	6	19	16	17	11	12	9	13	11	130	....
5..	1st....	14	....	15	18	8	12	12	15	18	8	9	16	145	145
	2d	8	13	11	12	8	11	14	18	13	10	7	16	141	....
8..	1st.....	14	17	13	14	18	17	15	11	12	14	15	10	170	170
	2d	9	16	16	7	2	13	14	8	6	11	7	6	115	....
12..	1st. ..	18	10	7	14	14	13	11	12	15	15	9	9	147	147
	2d	17	6	14	13	15	7	10	9	10	13	10	13	137	......
13..	1st. ...	9	....	...	6	16	11	12	9	12	13	9	12	109	109
	2d	....	....	....	1	*	...	....	....	...	......	......	......	1	....
14..	1st. ...	21	20	24	21	19	17	10	18	14	16	15	13	208	208
	2d	18	22	21	18	15	18	5	13	10	1	....	.. ..	141	....
	3d	....	....	...	....	2	12	14	*	....	......	......	....	28	....
19..	1st....	18	13	10	19	9	13	8	16	12	14	14	11	157	157
	2d	5	....	8	8	....	....	.	...	....	......	.....	13	34	....
47..	1st.....	...	12	19	18	19	16	19	17	19	15	14	16	184	200
	2d	13	13	15	13	7	12	18	17	16	16	14	13	167	....
50..	1st.....	..	17	19	20	17	19	14	14	13	10	13	5	165	173
	2d . ..	18	2	2	5	6	11	13	9	11	12	19	3	111	....
87..	1st.....	....	....	14	18	19	13	16	16	18	16	13	13	156	158
	2d	1	1	8	11	9	10	9	10	9	10	6	......	84	....
96..	1st.....	...	..	9	16	17	14	12	15	13	11	13	12	132	161
	2d	9	15	16	14	15	18	9	9	10	12	11	......	138	....
102..	1st.....	13	16	13	20	12	14	14	13	9	5	13	1	143	144
	2d	13	1	....	...	...	....	....	...	....	......	....	......	14	....

EGG RECORDS FOR TWO YEARS—CONCLUDED.

WHITE WYANDOTTE.

Number of hens.	Year.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	Yields Nov. 1st, 1898, to Nov. 1st, 1899, and Nov. 1st, 1899, to Nov. 1st, 1900.	Yields in first full year of laying.
105..	1st.....	..	....	15	13	18	8	11	15	15	13	11	19	138	157
	2d	8	11	....	...	9	14	13	..	....	......	......	.....	55	....
131..	1st....	....	.	11	19	17	11	17	14	12	11	12	11	135	147
	2d	8	2	14	6	6	15	....	9	7	9	9	9	94	....
134..	1st	...	....	9	16	16	17	14	16	14	10	15	6	133	165
	2d	16	16	15	8	13	12	14	7	8	8	12	9	138	.. ....
173..	1st.....	....	....	12	20	14	12	16	16	13	6	13	12	134	153
	2d	11	7	11	14	9	11	14	11	7	10	7	4	116	... .
224..	1st.....	....	...	1	19	10	16	15	14	18	16	14	8	131	167
	2d	12	14	12	8	12	12	12	13	15	11	6	12	139	....
242..	1st.....	....	....	....	15	24	13	16	16	17	14	12	14	141	167
	2d . ..	12	14	12	8	12	12	12	13	15	11	6	12	139	....
272..	1st.....	...	....	....	7	19	17	6	15	14	11	7	19	115	115
	2d	....	...	...	..	8	...	13	12	*	.....	.....	......	33	....
280..	1st. ...	...	....	....	5	1	13	23	18	21	15	21	21	138	170
	2d	17	15	9	5	11	14	9	2	....	......	......	......	82	....
287..	1st. ...	. ..	....	...	18	15	11	17	8	17	14	10	9	119	148
	2d	10	14	5	....	....	....	.. .	....	...	......	......	9	38	....
290..	1st. ..	....	....	....	16	12	15	14	12	13	14	14	11	121	162
	2d	13	20	8	2	8	19	15	8	9	8	20	3	133	....

Every hen that has laid large numbers of eggs through the first or the first and second years, has shown much vigor and constitution. Some individuals have laid heavily for a few months and then drooped and died, seemingly because they could not stand the heavy work.

There have been two hens in the pens all of the last year that we have every reason to suppose have never laid an egg. It is possible that they may have laid, but with the close watching they have had it is not probable. They are well formed and have always been in good thrift and health so far as appearances have indicated.

In the first table following, the yields of 67 hens are given for two years forward from November 1, 1898, and the records of four of them are continued through the third year. These are not all of the hens tested in 1898, but they are the only ones retained during the second year. Some of them were the best and others among the poorer layers of that year.

Of the four that laid over 200 eggs during the first 12 months after commencing, No. 4 laid 201 eggs the first year, 140 the second and 130 the third year, and she is now on her fourth year's work. No. 14 laid 208 eggs the first year, 141 the second and 28 the third year. She moulted in July, 1900, and met with an accident in August which came very near ending her existence, but her great vitality enabled her to rally and she shed her feathers again, completely, and grew a second suit that season. She did not begin laying again until the following March when she laid 28 eggs by the close of May. At moulting time in June she died. She was an upheaded, strong hen and the first one to give us over two hundred eggs in one year. No. 101 laid 201 large brown eggs the first year; 30 the second year and 63 the third year. She is now on her fourth year's work. No. 286 was a late hatched pullet and did not commence laying until February 12, 1899. In a year forward from that date she laid 206 eggs. In the first year, commencing November 1, 1899, she laid 191 eggs, with 157 during the second, and 138 in her third year. When nearly three and a half years old she died suddenly, having laid 119 eggs during the last 160 days she lived.

With many poultry keepers and farmers the idea is prevalent that if a hen lay but few eggs the first year she is likely to do better the second year than though she laid well during the first year. The data so far secured does not show that hens that yield 120 eggs or less the first year yield satisfactorily the second year. Those that yielded in the vicinity of a hundred or less the first year yielded very light the second year. On the other hand many of those that yielded from 130 to 200 or over during the first year laid quite well the second year.

Of the 67 hens carried through two years, 10 laid more eggs during the second than the first year, and 57 laid more during the first than the second year.

The right hand column of the tables shows the number of eggs laid by each bird during the first full year after she commenced laying, and in most cases it is larger than when the year is reckoned forward from November 1st. We have found it necessary to have the pullets, of the breeds we have used, hatched by the middle of April, at the latest, in order to have them laying by the first of November. They then have a full year for work, before they are removed, the following fall, to make room for the new pullets that must be in winter quarters early, if they are to do satisfactory work. If the pullet does not commence laying until January, she does not have a full year before she has to give way to the young stock by the last of October or the first of November. This feature counts for a great deal and the two right hand columns of the tables are worthy of careful study.

RECORDS OF PULLETS, 1899-1900.

On November 1st, 1899, 180 pullets of the three breeds previously mentioned were put into winter quarters and records kept with them during the twelve months following. The pens and yards in which they were confined were the same as those occupied by the hens in the preceding test. The pens are 10 by 16 feet in size in the clear space and each one has four of the Station trap nests in it as described in the Station reports of 1897 and 1898. Twenty pullets and two cockerels were kept in each lot.

The birds were fed throughout the year, daily as follows:—Each pen of 22 received one pint of wheat, in the deep litter early in the morning. At 9.30 A. M. one-half pint of oats was fed to them in the same way. At 1 P. M. one-half pint of cracked corn was given in the litter as before. At 3 P. M. in winter and 4 P. M. in the summer they were given all the mash they would eat up clean, in half an hour.

The mash was made of the following mixture of meals:—200 pounds wheat bran; 100 pounds corn meal; 100 pounds wheat middlings; 100 pounds linseed meal; 100 pounds meat meal or fine meat scraps. Part of the year the linseed meal was omitted, and the amount of meat meal was doubled. The mash contained one-fourth of its bulk of clover leaves and heads, secured from the feeding floor in the cattle barn. The clover was thoroughly soaked with hot water. The mash was made quite dry. Cracked bone, oyster shell, clean grit and water were at all times before them. Two large mangolds were fed to the birds in each pen daily in winter, and green food in plenty in summer. Very few soft-shelled eggs are produced and we have not known of an egg being eaten by the hens during the three years in which the trap nests have been used. Fifteen birds died during the year and nine were stolen.

A few eggs had been laid in the litter on the floor but no birds have received credit for eggs not laid in the nest. By reference to the table following it will be seen that many birds did not commence laying until some two months after others were at work. They were mainly the later hatched ones and illustrate forcibly the necessity for early hatched stock if a full year's work is to be gotten from it by November first.

10,611 eggs were laid in the nests by the Plymouth Rocks to October 31st—an average of 132 to each bird. Ten of the 80 died or were stolen and did not work a full year, but no deductions are made on that account.

No. 303 laid 208 eggs, and 127 in the following year. No. 326 laid 211, and 145 during the next year. No. 318 laid 237 good brown eggs in the year, and 102 the second year. After she had laid 200 the next dozen were saved as produced and found to weigh 1 pound, 11¼ ounces.

In the same pens receiving the same treatment as the foregoing and of the same breed, were Nos. 347, 361 and 375 and they yielded respectively 32, 42 and 36 eggs in the same time that their mates were doing their greatest work.

9,844 eggs were laid by the 80 White Wyandotte hens up to October 31st. Ten of their numbers died or were stolen during the year, but no allowance is made for their short work. The 80 averaged 123 eggs each. No. 403 laid 209 eggs to October 31st and in the full year after she commenced laying she laid 219. The second year she laid 162 eggs. No. 428 laid 217 to October 31st and in the full year 219. During the second year she laid 138. No. 445 laid 208 to October 31st and 219 to the close of her full year. The next year she yielded 139 eggs. No. 480 laid 214 to Oct. 31st and 218 at the close of full year. During the next year she gave 172 eggs. The poorest laying was done by Nos. 411; 462; 474; 475 and 478, their yields being respectively 62; 22; 41; 10 and 66 to October 31st. Although these poorer layers looked well when they were pullets, as they grew older several of them showed low vitality.

The twenty Brahmas laid 2,018 eggs to Oct. 31st, an average of nearly 101 eggs each. None of them reached the two hundred limit. Four either died or were stolen in the eighth and ninth months forward from Nov. 1st. The poorest laying for the year was done by No. 485. She gave a total yield of 2 eggs. While she was not a producer there was nothing in her looks or appearance to indicate that she was a drone. As the season advanced she became fleshy but she was not of the fleshy type at the commencement or during the early months of the year.

The following tables show the work of the individual birds by months and the totals.

EGG RECORDS OF HENS HATCHED BETWEEN APRIL 1 AND MAY 16, 1899

BARRED PLYMOUTH ROCKS.

Number of hen.	1899.		1900.										Total.
	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	
301...	16	14	16	11	9	16	†	.....	.....	.....	.....	.....	82
302...	.....	7	22	14	18	17	8	24	14	13	16	14	167
303...	8	17	22	5	12	20	25	26	21	21	21	16	208
304...	17	20	19	7	11	20	25	3	19	17	16	1	175
305...	11	22	19	14	16	5	14	15	14	16	11	14	171
306...	.....	16	12	.....	.....	18	5	4	.....	.....	.....	6	61
307...	2	18	21	16	18	19	20	9	12	12	15	13	175
308...	.....	10	21	14	15	19	11	14	12	*	.....	.....	116
309...	14	13	24	18	20	20	22	19	19	14	.....	.....	183
310...	.....	2	2	.....	7	15	18	5	16	3	.....	.....	68
311...	6	21	25	22	22	14	17	12	13	4	19	10	185
312...	1	10	13	.....	12	*	.....	.....	.....	.....	.....	.....	36
313...	.....	.....	21	10	15	19	5	.....	.....	.....	.....	.....	70
314...	5	8	14	13	11	13	9	6	*	.....	.....	.....	79
315...	.....	7	19	.....	6	5	13	*	.....	.....	.....	.....	50
316...	8	23	24	18	21	18	22	12	22	17	13	*	198
317...	6	22	25	18	19	18	†	.....	.....	.....	.....	.....	108
318...	18	22	25	21	22	24	23	22	25	17	16	2	237
319...	.....	12	15	2	6	14	10	.....	.....	.....	.....	.....	59
320...	.....	18	7	20	13	17	12	9	10	12	7	8	133
321...	.....	.....	13	16	20	18	17	22	15	21	18	10	170
322...	6	8	18	3	13	7	9	4	.....	.....	.....	.....	68
323...	.....	.....	11	14	20	.....	20	18	20	21	21	13	158
324...	12	16	17	13	6	21	17	14	12	20	6	9	163
325...	.....	15	22	15	13	11	10	3	13	7	11	.....	120
326...	13	21	21	18	16	22	16	16	16	15	14	23	211
327..	.....	19	22	7	4	9	13	3	2	*	.....	.....	79
328...	.....	18	14	15	11	15	.....	17	12	11	9	16	138
329...	.....	.....	21	10	15	20	19	15	10	11	13	.....	134
330...	8	18	26	17	18	*	.....	.....	.....	.....	.....	.....	87
331...	4	22	20	16	9	15	20	16	†	.....	.....	.....	121
332...	.....	14	24	3	20	20	18	11	15	21	13	.....	159
333...	.....	.....	14	17	22	20	22	14	7	8	11	9	144
334..	2	20	23	11	12	22	20	20	22	20	8	.....	180
335...	.....	.....	19	8	8	10	10	13	7	7	8	8	98
336...	.....	6	19	3	17	21	23	11	17	17	3	.....	137
337...	14	22	18	7	12	15	15	11	9	17	15	8	163
338...	.....	15	16	2	7	24	18	12	13	23	1	.....	131
339...	.....	1	23	.....	8	11	12	11	9	13	.....	.....	88
340...	8	28	25	19	14	13	14	16	8	12	17	7	181
341...	1	22	.....	5	13	17	18	14	14	11	5	14	134
342...	.....	.....	16	11	10	21	17	12	14	12	4	8	125
343.	14	24	17	14	9	20	14	16	12	17	8	13	178
344...	.....	.....	13	13	14	20	22	23	17	19	19	6	166
345...	12	19	20	18	19	17	13	2	11	11	11	.....	153
346...	8	17	22	11	11	12	13	13	12	9	7	15	150
347...	.....	.....	8	.....	12	11	1	.....	.....	.....	.....	.....	32
348...	.....	.....	16	17	19	20	18	16	15	12	13	6	152
349...	.....	.....	5	7	3	14	21	20	16	9	5	*	100
350...	.....	19	21	17	19	14	17	15	12	17	12	15	176
351...	2	22	21	1	14	10	13	14	10	9	13	.....	129
352..	7	17	14	11	16	16	16	12	11	11	14	12	153
353...	17	14	24	16	18	20	20	15	14	13	8	19	193
354...	.....	.....	9	7	10	22	18	19	18	1	.....	.....	104
355...	.....	.....	3	.....	3	17	11	13	12	7	10	.....	76
356...	.....	.....	15	2	9	19	22	13	15	13	19	5	132
357...	21	2	23	15	21	21	18	16	17	13	10	4	181
358..	18	17	21	9	9	17	11	15	8	9	13	.....	147
359...	8	2	21	17	16	17	16	15	16	16	11	16	170
360.	.....	.....	18	8	16	13	10	9	11	10	11	9	115

* Dead. † Stolen.

EGG RECORDS—CONTINUED.

BARRED PLYMOUTH ROCKS.

Number of hen.	1899.		1900.										Total
	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	
361...	......	......	..... .	.....	4	2	4	14	8	....	8	2	42
362...	......	.....	18	8	6	19	19	15	5	......	......	......	90
363...	......	......	12	9	13	17	15	14	11	8	12	6	117
364...	4	14	11	12	11	16	22	19	20	12	18	15	174
365...	...	8	22	15	21	25	21	20	15	23	9	......	179
366...	.....	5	10	......	15	16	8	8	11	10	6	......	89
367...	......	......	24	21	17	14	11	9	14	16	10	5	141
368...	15	16	22	7	16	15	16	3	8	9	14	5	145
369...	9	18	10	4	9	14	21	9	10	15	......	16	135
370...	4	23	21	7	4	8	11	2	......	.....	......	......	80
371...	9	18	22	21	24	21	11	7	2	11	2	1	149
372...	.....	.. ...	2	.....	1	13	24	.....	16	5	......	.....	55
373...	......	......	14	......	10	17	24	20	21	21	12	2	141
374...	11	16	16	7	16	18	16	14	9	8	8	3	139
375...	......	......	19	16	.....	....	6	1	.. ...	.....	. ....	......	36
376...	.....	20	22	2	17	11	12	10	9	11	12	2	128
377...	6	20	15	......	11	16	16	15	15	13	10	6	143
378...	5	15	24	19	22	21	17	15	14	13	2	....	163
379...	.....	......	15	10	7	21	11	18	13	14	14	......	129
380...	.....	......	......	1	2	5	11	16	16	16	18	15	100
381...	.. ...	......	9	14	15	21	22	20	15	20	19	14	169

WHITE WYANDOTTES.

Number of hen.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	Total
401...	......	12	20	16	9	17	16	11	16	11	...	......	128
402...	12	1	11	22	17	19	†	......	......	.....	......	.....	82
403...	4	25	26	17	21	18	21	16	13	14	16	18	209
404...	3	24	12	......	13	16	12	10	16	9	13	15	142
405...	*	......	......	......	.....	.....	......	......	......	......	......	......	......
406...	17	22	16	13	20	13	17	14	12	10	12	......	166
407. .	... ..	.....	8	.....	11	19	19	16	11	6	5	9	104
408 ..	6	22	22	15	9	22	17	16	14	17	11	8	179
409...	......	16	21	11	9	15	†	......	....	......	......	....	72
410...	8	15	23	20	24	22	13	19	17	......	16	19	195
411...	6	14	14	3	14	11	......	......	.....	......	......	.....	62
412...	8	16	16	19	15	18	18	9	14	17	13	19	178
413...	*	......	......	.....	......	.....	.....	....	......	......	......	......	....
414...	4	17	19	16	18	12	13	13	11	11	7	8	149
415...	5	19	18	10	15	9	22	16	16	3	11	11	155
416...	14	2	13	10	12	19	11	15	11	9	3	10	129
417...	......	12	22	15	7	11	†	......	.....	.....	......	......	67
418. .	.....	17	20	1	21	13	13	15	14	7	7	......	128
419...	.....	...	15	11	21	15	17	5	11	9	9	......	113
420...	...	.. .	1	17	22	18	20	5	......	.....	......	......	83
421..	7	13	18	6	10	5	12	9	11	16	11	......	108
422...	11	21	14	11	14	17	15	11	12	3	*	......	129
423...	.....	4	19	9	12	20	20	15	9	1	10	1	120
424...	......	.....	11	13	15	15	16	14	11	16	4	. ...	115
425..	.....	13	24	21	22	22	24	10	10	11	16	......	173
426...	.....	9	20	17	13	13	15	12	13	10	3	......	125
427...	......	......	3	14	19	16	15	11	12	10	......	......	100
428...	13	22	21	19	21	24	25	14	14	18	5	21	217
429...	2	16	15	16	16	17	10	1	.....	... .	......	.....	93
430...	.....	...	21	16	18	20	16	*6	.. ..	.... .	. ...	......	97
431...	3	18	23	18	10	19	20	15	18	14	7	17	179
432...	......	......	15	12	14	10	16	2	*	.....	......	......	69
433...	9	22	5	13	15	16	10	15	15	4	18	6	147
434...	2	20	18	16	13	16	11	14	13	10	11	......	144
435...	......	......	19	18	13	23	17	13	14	9	24	14	164
436...	......	2	14	8	6	17	21	20	7	12	......	......	107

* Dead. † Stolen.

EGG RECORDS—CONTINUED.

WHITE WYANDOTTES.

Number of hen.	1899.		1900.										Total.
	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	
437...	....	....	7	17	21	22	21	21	14	7	18	8	156
438...	2	18	6	5	13	11	15	8	7	6	8	....	99
439...	6	22	21	9	19	15	16	14	19	6	6	15	163
440...	15	24	18	20	21	22	22	11	*	....	....	....	153
441...	....	....	16	12	11	11	13	7	13	....	16	18	117
442...	8	12	15	10	15	18	18	16	19	16	16	8	171
443...	....	....	13	11	8	8	19	21	16	16	17	16	142
444...	....	....	4	19	11	19	14	12	13	13	3	19	126
445...	7	23	25	21	13	21	19	12	19	17	11	20	208
446...	2	23	15	....	9	16	15	12	15	16	11	20	153
447...	....	6	20	8	....	5	10	9	9	11	10	10	98
448...	10	11	23	19	20	15	18	11	13	13	15	7	175
449...	....	....	10	12	14	15	11	12	15	7	8	....	104
450...	....	....	12	12	1	12	11	8	10	7	12	2	87
451...	5	23	23	19	13	19	22	12	18	23	14	5	196
452...	....	....	15	9	15	14	16	4	10	11	13	....	107
453...	....	....	6	13	9	6	8	10	9	....	....	....	61
454...	16	26	5	13	6	2	....	....	....	....	....	....	68
455...	12	22	23	18	15	18	17	12	16	9	15	16	193
456...	13	18	18	3	16	13	17	10	....	13	4	12	136
457...	....	....	14	14	9	7	10	8	8	8	....	....	78
458...	3	21	20	15	15	5	13	12	8	8	....	....	120
459...	....	16	22	19	16	22	16	12	12	16	10	19	180
460...	....	12	20	13	13	10	13	12	12	11	....	10	126
461...	9	23	7	14	18	19	17	11	13	10	14	23	178
462...	....	....	10	1	....	11	....	....	....	....	....	....	22
463...	....	....	12	16	18	9	....	8	14	5	15	11	108
464...	....	....	10	3	10	....	5	16	14	6	4	....	68
465...	....	21	12	....	14	14	13	10	11	10	11	3	119
466...	....	....	16	18	23	9	†	....	....	....	....	....	66
467...	....	21	23	15	9	14	9	5	5	12	7	10	130
468...	....	....	7	19	18	19	17	19	19	12	19	22	171
469...	12	22	22	11	....	3	....	11	9	14	12	11	127
470...	....	....	20	12	19	20	15	14	22	8	7	4	141
471...	....	....	17	19	....	16	13	14	5	3	....	....	87
472...	....	....	3	13	17	16	11	8	10	....	....	....	78
473...	....	18	19	..	13	12	17	10	8	10	7	4	118
474...	....	....	6	13	12	....	8	2	....	....	....	....	41
475...	....	....	3	....	....	2	3	....	....	1	....	1	10
476...	....	3	24	12	12	20	14	14	11	12	5	5	132
477...	3	20	22	11	17	13	14	9	12	10	13	13	156
478...	....	....	10	5	19	....	16	16	....	....	....	....	66
479...	....	14	23	18	13	13	20	12	16	9	14	17	167
480...	16	24	23	19	17	21	17	20	17	15	15	10	214
LIGHT BRAHMAS.													
481...	....	21	21	7	2	17	19	13	11	6	11	10	138
482...	7	17	3	17	4	14	9	5	11	....	15	12	114
483...	....	18	9	12	5	11	15	3	10	....	....	....	83
484...	4	21	16	14	9	17	23	18	14	7	....	....	143
485...	....	....	1	....	....	....	1	....	....	....	....	....	2
486...	7	16	12	4	4	16	16	12	17	10	14	10	138
487...	....	19	20	10	10	16	14	6	12	....	14	6	127
488...	....	10	18	....	....	....	....	11	21	18	12	....	90
489...	....	....	4	9	1	16	19	9	11	12	14	....	95
490...	4	22	19	7	7	17	6	5	†	....	....	....	87
491...	2	18	18	16	8	17	16	20	19	19	10	1	164
492...	....	15	15	3	4	....	17	13	13	16	3	....	99

* Dead. † Stolen.

EGG RECORDS—CONCLUDED.

LIGHT BRAHMAS.

Number of hen.	1899.		1900.										Total.
	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	
493...	......	......	4	13	5	16	10	13	13	14	7	12	107
494...	......	18	18	5	10	18	11	*	......	.....	.....	......	80
495...	13	20	4	6	1	18	13	1	†	. . .	... .	.....	76
496...	......	4	14	4	15	7	11	7	*	....	......	......	62
497...	......	13	13	15	12	16	12	12	8	8	9	......	118
498...	......	......	2	2	.....	......	2	2	....	3	7	.....	18
499...	... .	8	7	3	6	17	22	22	17	17	10	18	147
500...	14	21	18	.....	14	11	12	8	14	2	9	7	130

* Dead. † Stolen.

RECORDS OF PULLETS, 1900-1901.

On November 1, 1900, 100 April and May hatched Barred Plymouth Rock pullets, and 90 White Wyandotte pullets hatched at the same time were put into the house previously described and treated in the same manner that their predecessors had been during the two preceding years.

Fourteen of the Rocks and 17 of the Wyandottes died during the year. There was no evidence of disease among them. Up to October 31, 1901, the hundred Plymouth Rocks laid 13,200 eggs; an average of 132 to each bird. Six birds yielded from 200 to 234 eggs each to October 31st, and in the same pens were six of their mates that laid only between 23 and 70 eggs each. There were six others that yielded over 200 eggs each before the first year of their laying was completed, making 12 hens that each laid 200 eggs or over, during the first year, out of the 100 put in to the test at the commencement of the year. The best work by any hen since we have been selecting the breeding stock by the present method was done this year by No. 617 who gave her first egg November 29, 1900, and to November 28, 1901, she had laid 251 eggs.

The ninety White Wyandottes laid 11,184 eggs to Oct. 31, an average of 124 to each one. Six birds yielded from 203 to 233 eggs each. The six poorest layers gave yields between 36 and 65 eggs each. The following tables show the monthly yields for this year.

EGG RECORDS OF HENS HATCHED DURING APRIL AND MAY, 1900.

Barred Plymouth Rocks.

Number of hen.	1900.		1901.										Total.
	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	
601...	5	15	7	16	20	21	22	21	11	2	4	2	146
602...	......	7	22	24	25	25	11	3	....	......	.....	.....	117
603...	16	24	23	20	16	20	......	17	13	23	4	20	196
604...	......	....	.....	1	24	22	20	20	19	9	17	5	137
605...	.....	7	12	19	10	25	†	......	....	......	....	......	73
606...	1	18	2	7	18	8	14	1	6	.....	1	......	76
607...	2	4	9	9	23	23	23	16	15	17	20	9	170
608...	......	......	.....	2	27	28	24	27	24	26	22	15	195
609...	13	17	20	21	21	20	6	19	16	20	20	7	200
610...	....	5	12	10	9	8	2	*	......	......	....	......	46
611...	.....	......	13	21	26	17	21	18	19	18	14	18	185
612...	11	15	22	18	19	22	23	21	10	21	18	9	209
613...	6	20	23	18	15	19	12	......	......	1	....	1	115
614...	......	6	16	.....	7	.. ..	1	*	......	.....	....	...	30
615...	......	.....	......	13	13	23	7	......	.. .	......	......	.....	56
616...	......	11	18	4	5	24	20	21	13	12	8	......	136
617...	1	19	22	22	23	23	23	18	17	24	21	21	234
618...	16	19	20	15	8	16	20	17	16	15	21	8	191
619...	15	12	9	21	13	26	24	21	13	12	17	13	199
620...	1	4	18	7	9	16	15	10	20	12	13	13	138
621...	....	16	23	18	20	24	19	18	20	17	15	......	190
622...	......	......	15	4	16	13	12	15	10	8	6	......	99
623...	10	14	22	11	12	23	24	22	24	7	9	5	183
624...	4	18	16	16	17	20	14	9	10	8	13	......	145
625...	.....	2	21	19	22	19	23	22	15	15	19	1	178
626...	......	6	1	13	17	15	15	11	11	9	......	4	107
627...	.....	......	10	19	7	3	2	6	6	3	5	.....	61
628...	....	......	.....	5	19	16	19	22	20	19	12	....	132
629...	1	22	18	1	19	13	......	*	......	.....	....	.....	74
630...	18	24	24	21	24	13	17	16	17	15	6	18	213
631...	5	25	12	19	21	19	9	13	13	9	19	1	165
632...	......	3	22	15	19	22	20	20	16	8	21	19	185
633...	......	16	15	12	11	23	16	11	18	15	8	......	145
634...	......	......	7	7	18	11	10	10	10	7	8	4	92
635...	9	24	24	22	20	22	12	11	13	16	15	2	190.
636...	......	.....	8	17	19	16	12	......	17	2	*	....	91
637...	......	....	.....	2	14	1	*	....	......	......	......	.....	17
638...	....	......	15	10	17	16	13	11	7	5	6	....	100
639...	.....	.....	19	12	20	9	*	......	......	......	....	......	60
640...	......	21	17	15	15	12	18	12	8	......	11	.....	129
641...	......	.....	......	5	22	25	21	21	17	17	15	12	155
642...	7	23	21	15	12	20	17	20	9	17	11	7	169
643...	......	9	14	19	16	13	17	11	8	15	9	......	131
644...	......	......	13	15	8	18	11	7	2	.....	......	.....	74
645...	....	14	18	22	21	22	16	25	22	13	8	......	181
646...	9	16	4	20	22	20	14	19	9	14	15	4	166
647...	1	.....	5	9	5	18	23	23	19	19	15	9	146
648...	15	18	19	15	19	16	8	18	13	17	17	7	182
649...	.....	22	19	6	20	24	22	21	14	17	8	17	190
650...	.. ..	.....	20	14	23	22	20	17	18	2	3	......	139
651...	......	15	9	10	18	24	19	13	18	18	22	4	170
652...	......	.....	4	1	17	21	19	9	16	7	16	......	110
653...	......	14	17	15	24	22	10	21	13	12	*	......	148
654...	.....	10	18	16	17	25	20	24	24	20	15	......	189
655...	17	22	21	11	13	7	.....	.....	......	......	....	......	91
656...	......	......	1	2	24	19	14	10	17	.....	6	2	95
657...	.....	15	19	9	4	14	21	22	18	18	19	18	177
658...	......	.....	5	17	20	20	14	17	18	16	15	2	144
659...	7	19	20	16	18	19	22	17	14	4	2	......	160
660...	......	....	16	20	21	11	15	11	9	13	13	8	137

* Dead. † Stolen.

EGG RECORDS—CONTINUED.

BARRED PLYMOUTH ROCKS.

Number of hen.	1900.		1901.										Total.
	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	
661...	.....	.....	10	15	20	11	17	11	7	10	12	10	123
662...	....	.....	1	16	20	20	22	5	......	1	*	.....	85
663...	17	19	20	16	8	13	9	10	16	17	10	.....	155
664...	5	21	5	12	9	24	20	21	20	16	18	.....	175
665...	21	20	10	18	16	15	13	9	15	9	17	11	174
666...	......	.....	.....	20	8	17	13	14	13	14	13	3	115
667...	......	......	3	16	17	3	*	.....	.....	......	......	....	39
668...	....	2	1	15	20	13	13	16	13	1	......	1	94
669...	......	3	19	20	26	23	19	18	14	19	17	1	179
670...	......	6	13	5	22	12	20	21	24	19	21	4	167
671...	5	20	6	22	18	21	16	16	18	15	10	......	167
672...	3	22	20	18	23	21	13	16	16	16	12	20	200
673...	.....	13	3	9	7	14	16	9	19	15	.....	.....	105
674...	......	....	16	18	22	14	14	16	16	15	5	18	154
675...	......	......	3	6	8	......	6	....	.....	......	.....	......	23
676...	8	13	27	21	25	24	16	14	17	13	21	10	209
677...	......	......	9	15	14	8	......	.....	8	.....	....	......	54
678...	4	1	......	17	19	14	23	17	14	9	11	......	129
679...	......	......	8	17	23	14	1	.....	7	.....	.....	......	70
680...	1	10	13	17	21	26	22	23	14	8	3	.....	157
681...	.....	9	13	16	19	21	14	15	15	12	11	4	149
682...	......	.....	9	5	11	8	1	*	.....	......	......	....	34
683...	1	17	20	19	22	26	12	*	......	......	......	....	117
684...	......	...	3	2	23	21	23	22	25	23	22	6	170
685...	9	.....	23	15	15	20	14	10	11	8	12	2	139
686...	...	.....	....	5	1	....	8	11	2	10	......	14	51
687...	.....	......	4	19	9	17	15	*	.....	......	....	....	64
688...	......	....	2	21	16	12	10	9	8	7	2	......	87
689...	......	......	10	22	27	25	24	22	20	19	12	....	181
690...	......	......	11	14	20	19	17	10	13	16	2	15	137
691...	.....	......	9	21	20	21	14	19	16	21	16	20	177
692...	....	......	6	20	22	20	10	8	14	13	10	18	141
693...	.....	....	.....	16	11	19	1	.....	.....	......	......	......	47
694...	......	......	8	12	6	3	3	9	*	......	......	....	40
695...	.....	......	19	11	12	24	22	16	16	15	2	....	137
696...	...	.....	14	22	20	22	30	23	22	27	9	*	189
697...	......	.....	16	8	6	15	16	8	......	3	......	......	72
698...	......	.....	23	24	24	15	20	19	17	21	21	8	192
699...	....	....	5	9	6	16	14	20	18	9	12	1	110
700...	....	......	8	21	26	19	14	14	......	18	5	7	132
WHITE WYANDOTTES.													
701...	12	21	17	.....	7	7	3	*	......	......	......	....	67
702...	...	10	15	16	19	20	21	12	14	14	12	3	156
703...	......	.....	17	15	4	21	19	17	10	.....	......	......	103
704...	10	21	17	14	12	12	7	13	12	10	......	....	128
705...	12	4	19	17	18	15	14	11	13	.....	14	5	142
706...	15	15	3	18	16	21	22	15	15	20	18	3	181
707...	12	11	23	11	11	19	17	14	15	12	12	2	159
708...	.....	......	14	4	13	8	9	12	7	14	.....	......	81
709...	......	18	19	19	21	12	16	12	15	12	15	8	167
710...	5	2	22	20	8	22	12	12	12	16	7	......	138
711...	......	20	19	1	15	10	6	.....	.....	.....	1	......	72
712...	.....	....	18	19	17	19	18	11	11	10	7	1	131
713...	10	15	18	11	13	14	14	13	10	12	13	1	144
714...	......	3	22	17	15	14	15	13	.....	11	7	7	124
715...	.....	......	17	15	10	14	13	12	8	11	9	12	121
716...	.....	......	15	15	14	20	19	20	13	11	5	.....	132
717...	13	15	18	12	15	9	17	8	12	6	12	7	144

* Dead.

EGG RECORDS—CONTINUED.

WHITE WYANDOTTES.

Number of hen.	1900.		1901.										Total.
	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	
718...	4	21	9	18	15	11	13	14	15	12	11	11	154
719...	.....	.....	16	4	6	.....	.....	.....	2	8	6	10	52
720...	18	5	23	17	20	13	1	11	5	.....	.....	.....	113
721...	7	21	23	18	13	17	9	.....	.....	.....	.....	.....	108
722...	.....	7	18	16	16	13	5	.....	.....	1	*	.....	76
723...	.....	4	20	21	21	15	16	18	12	12	22	.....	161
724...	18	20	19	18	16	20	10	19	15	16	9	15	195
725...	9	5	17	10	3	3	*	.....	.....	.....	.....	.....	47
726..	.....	14	14	4	8	5	14	2	3	.....	.....	.....	64
727...	7	14	14	15	13	15	10	14	7	6	1	8	124
728...	1	17	19	16	18	21	24	17	16	*	.....	.....	149
729...	5	16	20	20	20	24	7	20	9	25	22	15	203
730...	9	8	21	15	14	4	.....	7	8	.....	14	7	107
731...	.....	.....	16	14	4	*	.....	.....	.....	.....	.....	.....	34
732...	4	.....	13	14	12	8	5	11	13	.....	.....	.....	86
733...	14	18	19	13	1	.....	1	*	.....	.....	.....	.....	66
734...	12	20	21	15	12	8	*	.....	.....	.....	.....	.....	88
735...	.....	2	20	21	26	21	14	14	15	14	11	18	176
736...	7	20	22	15	8	7	*	.....	.....	.....	.....	.....	79
737..	.....	13	2	8	15	*	.....	.....	.....	.....	.....	.....	38
738...	3	3	12	19	24	19	16	16	6	16	9	20	163
739...	.....	6	11	17	3	18	19	2	18	18	10	17	139
740...	1	7	10	3	1	*	.....	.....	.....	.....	.....	.....	22
741...	.....	3	22	8	13	17	13	10	13	18	12	7	136
742...	2	21	21	17	18	19	23	22	21	20	12	.....	208
743...	10	14	13	7	13	12	10	8	7	9	7	12	119
744...	23	4	21	21	10	19	16	10	16	18	13	2	173
745...	.....	3	17	15	19	21	21	19	19	18	7	.....	159
746...	.....	.....	9	4	18	11	9	*	.....	.....	.....	.....	51
747...	6	18	19	14	14	17	22	18	21	12	15	10	186
748...	.....	.....	11	16	19	13	7	5	8	6	6	9	90
749 ..	7	19	23	19	20	23	22	8	15	9	*	.....	165
750...	.....	.....	19	15	13	10	*	.....	.....	.....	.....	.....	57
751...	5	5	18	17	18	18	19	14	18	8	16	10	166
552...	8	13	20	14	13	12	7	.....	.....	.....	.....	.....	87
753...	20	13	22	21	19	21	13	20	14	22	9	23	217
754...	10	5	16	7	13	9	10	8	12	9	.....	.....	99
755...	9	9	11	13	11	7	2	.....	.....	.....	.....	.....	62
756...	.....	.....	15	12	12	18	13	13	14	15	10	12	134
757...	.....	.....	20	16	19	19	1	10	20	13	13	10	141
758...	.....	.....	10	1	13	1	.....	9	1	12	.....	7	54
759...	9	7	16	1	.....	3	.....	.....	.....	.....	.....	.....	36
760...	17	17	14	9	8	20	14	10	1	.....	9	.....	119
761...	.....	15	11	6	14	12	11	12	14	10	13	.....	118
762...	19	5	21	2	10	19	21	24	18	20	19	8	186
763...	9	3	18	17	18	20	19	18	12	.....	6	19	159
764...	.....	3	18	6	20	15	15	13	.....	.....	.....	.....	90
765...	16	22	18	4	15	21	23	23	22	23	19	20	226
766...	13	14	17	8	7	17	19	16	12	21	19	10	173
767...	16	23	16	11	9	3	.....	.....	.....	.....	.....	.....	78
768...	4	2	18	12	11	10	12	16	10	12	8	4	119
769...	10	15	10	6	8	18	13	14	13	15	12	12	146
770...	18	21	23	19	17	19	17	15	16	8	15	19	207
771...	.....	13	19	3	11	11	8	.....	.....	.....	.....	.....	65
772...	10	19	11	19	16	19	14	10	11	10	14	8	161
773...	13	.....	14	13	12	18	5	4	3	*	.....	.....	82
774...	12	.....	6	16	18	19	10	*	.....	.....	.....	.....	81
775...	16	20	22	13	23	17	8	8	7	*	.....	.....	134
776...	18	3	17	9	12	15	13	14	14	13	12	.....	140
777...	18	22	22	20	16	21	22	16	16	23	21	16	233

* Dead.

EGG RECORDS—CONCLUDED.

WHITE WYANDOTTES.

Number of hen.	1900.		1901.										Total.
	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	
778...	4	11	20	10	4	20	10	18	15	17	21	13	163
779...	15	8	22	15	10	16	20	23	11	18	16	9	183
780...	17	15	15	14	14	13	13	8	15	16	17	9	166
781...	11	14	10	19	2	14	2	6	5	3	1	......	87
782...	7	13	21	20	18	12	18	15	12	15	2	.....	153
783...	12	19	10	13	14	11	16	12	16	15	12	11	161
784...	......	8	14	20	14	4	......	.....	.....	......	......	......	60
785...	15	16	12	2	12	16	7	.....	......	......	....	......	80
786...	22	19	14	13	5	12	11	12	4	13	11	14	150
787...	.....	17	21	21	17	23	13	*	.....	......	.....	....	112
788...	10	11	13	14	9	7	17	12	15	11	9	.....	128
789...	....	13	16	3	13	25	17	19	11	11	19	18	165
790...	.....	12	19	15	4	14	10	10	1	*	.....	......	85

* Dead.

CONCLUSION.

This report does not deal with results, for sufficient time has not yet elapsed since beginning the test to breed birds and test their laying qualities.

During the three years in which we have been selecting breeding stock by use of the trap nests we have found 30 hens that laid between 200 and 251 eggs each in a year. Twenty-six of them are now in our breeding pens and constitute —until other additions are made to them—the "foundation stock" upon which our breeding operations are based. Males for our use have been raised from them during the last two years. The number of the foundation stock, now secured, makes practicable the avoidance of inbreeding, and this is to be strictly guarded against, as it is doubtful if the inbred hen has sufficient constitution to enable her to stand the demands of heavy egg production.

All of the other breeding stock we are now carrying are tested hens that have laid over 180 eggs in a year; pullets whose mothers laid over 200 eggs in one year and whose fathers' mothers laid over 200 eggs in a year; and pullets sired by cockerels whose mothers and grandmothers laid over 200 eggs in one year. The size and color of the Plymouth Rock eggs are very fine. The eggs from the Wyandottes are of good shape and size, but as yet too light in color.